

## **Appendage to Measuring the Quality of Residential Property Reappraisal**

This appendage presents the results of including sales that were not included in the group of sales analyzed in the original Measuring the Quality of the 2003 Residential Reappraisal study. In the original study 5,553 sales were used in the analysis. Sales with ratios less than 67.9% or greater than 147.0% were not included in the original study. These sales had ratios that were more than two standard deviations from the log of the ratios. There were 372 excluded sales, or 6.7% of the total number of sales. The purpose of this appendage is to analyze this excluded group of sales and determine what impact, if any, inclusion of these sales in the original analysis would have had on the original results.

### **Results**

The additional sales were analyzed in the same manner as the sales in the original study. Appendix A displays the number of sales by county in the original analysis and the additional 379 sales. Intuitively, such a small number should not significantly impact the results from the original study.

To determine if this is true, the 379 sales were combined with the original sales and all sales were analyzed as a whole. The results were very similar to the original study. It should be noted that sales with ratios far from the median should be examined carefully to determine whether they can legitimately be included in a ratio study analysis. Given time constraints this was not done.

The statewide overall level of assessment, as measured by the median ratio, is 99.07% for the combined sales data set, compared to 99.18% in the original study. The COD for the combined data set is 12.7% as compared to 9.7% of the original study. A COD of 12.7% is still below the 15% level recommended by IAAO and within the COD standards.

The statewide price-related differential for the combined data set is 1.0299, which is just within the 0.98 to 1.03 range suggested by the IAAO. This indicates that neither progressivity or regressivity occurred in the reappraisal. For comparison, the original study revealed a price-related differential of 1.0195.

### **Conclusion**

Although inclusion of the omitted sales would change the uniformity statistics (standard deviation, COD and PRD) among counties with low numbers of sales, the addition of the excluded sales has little impact statewide on the original study. Statistical analysis of all available sales, using standards recommended by IAAO, does not change the conclusion of the original study. That conclusion was that the 2003 reappraisal can be characterized as being of high quality.

## Appendix A

### County Analysis of Sales Sales Ommitted in Original Analysis

County	Number in Original Analysis	Number Ommitted*	Total Number Combined	Ommited as % of Total
Beaverhead	43	2	45	4.4%
Big Horn	16	8	24	33.3%
Blaine	5	5	10	50.0%
Broadwater	8	1	9	11.1%
Carbon	89	6	95	6.3%
Carter	3	1	4	25.0%
Cascade	498	16	514	3.1%
Chouteau	16	1	17	5.9%
Custer	64	4	68	5.9%
Daniels	7	1	8	12.5%
Dawson	34	1	35	2.9%
Deer Lodge	35	5	40	12.5%
Fallon	11	4	15	26.7%
Fergus	53	10	63	15.9%
Flathead	722	41	763	5.4%
Gallatin	810	46	856	5.4%
Garfield	3	0	3	0.0%
Glacier	10	7	17	41.2%
Golden Valley	0	0	0	NA
Granite	13	5	18	27.8%
Hill	78	6	84	7.1%
Jefferson	58	3	61	4.9%
Judith Basin	5	1	6	16.7%
Lake	73	6	79	7.6%
Lewis & Clark	364	22	386	5.7%
Liberty	1	2	3	66.7%
Lincoln	160	5	165	3.0%
Madison	131	11	142	7.7%
McCone	5	1	6	16.7%
Meagher	9	2	11	18.2%
Mineral	18	6	24	25.0%
Missoula	663	29	692	4.2%
Musselshell	5	4	9	44.4%
Park	90	7	97	7.2%
Petroleum	1	0	1	0.0%
Phillips	7	2	9	22.2%
Pondera	15	2	17	11.8%
Powder River	3	2	5	40.0%
Powell	13	2	15	13.3%
Prairie	4	2	6	33.3%
Ravalli	234	14	248	5.6%
Richland	24	4	28	14.3%
Roosevelt	20	4	24	16.7%
Rosebud	27	4	31	12.9%
Sanders	46	6	52	11.5%
Sheridan	19	1	20	5.0%
Silver Bow	150	18	168	10.7%
Stillwater	36	3	39	7.7%
Sweet Grass	20	1	21	4.8%
Teton	22	3	25	12.0%
Toole	16	2	18	11.1%
Treasure	2	1	3	33.3%
Valley	38	11	49	22.4%
Wheatland	5	1	6	16.7%
Wibaux	0	0	0	NA
Yellowstone	<u>751</u>	<u>20</u>	<u>771</u>	<u>2.6%</u>
<b>Totals</b>	<b>5,553</b>	<b>372</b>	<b>5,925</b>	<b>6.7%</b>

\*Those ommitted from the original analysis had a ratio of less than 67.9% or greater than 147.0%.  
Criteria for ommitted sales is two standard deviations from the log of the ratios.

**Appendix B - Using Old Reappraisals in Analysis**  
**Assessment Level, Coefficient of Dispersion (COD), and Price Related Difference (PRD)**  
**Counties with 30 or More Sales and Grouped Counties**

PRD = Mean / Wtd. Mean

County Name	Count of Sales	Median	Mean	Wtd. Mean	Standard Deviation	(COD) Coefficient of Dispersion	(PRD) Price Related Difference
Beaverhead	43	0.7863	0.8441	0.8569	0.2235	21.9%	0.9850
Carbon	88	0.8458	0.8844	0.8176	0.3113	25.1%	1.0817
Cascade	507	0.8456	0.8508	0.8433	0.1494	12.2%	1.0088
Custer	62	0.9092	0.9739	0.8845	0.3583	27.9%	1.1011
Dawson	34	0.9292	0.9576	0.9395	0.1829	15.2%	1.0193
Deer Lodge	32	0.7182	0.7820	0.7176	0.2412	26.2%	1.0897
Fergus	58	0.8740	0.9003	0.8299	0.2540	19.2%	1.0849
Flathead	729	0.8051	0.8190	0.7783	0.1872	17.1%	1.0523
Gallatin	790	0.7549	0.7534	0.7546	0.1691	17.4%	0.9984
Hill	77	0.9125	0.9410	0.9152	0.2168	16.2%	1.0282
Jefferson	57	0.7585	0.7575	0.7873	0.1372	13.8%	0.9621
Lake	78	0.8003	0.8421	0.7791	0.2071	21.1%	1.0808
Lewis & Clark	354	0.8221	0.8157	0.8219	0.1716	15.0%	0.9925
Lincoln	162	0.8634	0.8548	0.8408	0.1843	16.6%	1.0166
Madison	122	0.7427	0.8031	0.6796	0.2647	27.1%	1.1817
Missoula	660	0.7655	0.7712	0.7627	0.1449	13.5%	1.0111
Park	90	0.7873	0.7978	0.7826	0.2052	19.8%	1.0194
Ravalli	233	0.7923	0.7860	0.7898	0.1540	14.9%	0.9952
Sanders	50	0.8250	0.8721	0.8237	0.2140	20.1%	1.0587
Silver Bow	165	0.9443	1.0357	0.9163	0.3606	28.1%	1.1303
Stillwater	37	0.7221	0.7715	0.7580	0.2015	20.3%	1.0178
Valley	33	1.0000	1.0866	0.9476	0.3824	26.3%	1.1467
Yellowstone	740	0.7862	0.7887	0.7915	0.1343	12.4%	0.9964
Mineral, Granite, Powell	57	0.6302	0.6176	0.6166	0.0522	27.3%	1.0016
Broadwater, Golden Valley, Meagher, Musselshell, Sweet Grass, Wheatland	56	0.6402	0.6485	0.6466	0.0288	22.1%	1.0029
Blaine, Chouteau, Glacier, Judith Basin, Liberty, Pondera, Teton, Toole	113	0.6937	0.6906	0.6877	0.0341	15.4%	1.0042
Big Horn, Garfield, Petroleum, Phillips, Rosebud, Treasure	71	0.6875	0.7001	0.6938	0.0410	14.6%	1.0091
Carter, Fallon, McCone, Powder River, Prairie, Richland, Wibaux	64	0.6900	0.6743	0.6729	0.0401	17.2%	1.0021
Daniels Roosevelt, Sheridan	52	0.6668	0.6935	0.6873	0.0352	19.5%	1.0090
<b>Statewide</b>	<b>5,579</b>	<b>0.8053</b>	<b>0.8235</b>	<b>0.7906</b>	<b>0.2091</b>	<b>18.0%</b>	<b>1.0416</b>